

length of time material has been kept, and further study will be required for its explanation.

Since *Cenangium fulvo-tingens* B. & C. shows the same reddish brown KOH reaction as some species of *Ionomidotis* and also agrees in its other essential characters, it may be considered to belong to that genus, if the generic concept is broadened to include species having a reddish-brown as well as a violet KOH reaction. Of the species listed by Durand, it is closest to *I. olivascens*, but differs from the latter in the smaller spores. The apothecia are described by Berkeley and Curtis as externally brownish-pulverulent; the specimens in the Michener Collection fail to show this character, which is most noticeable in the Pennsylvania collection made by Dr. Overholts.

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ICHTHYOLOGY.—*Twenty one new American gobies*.<sup>1</sup> ISAAC GINSBURG, U. S. Bureau of Fisheries. (Communicated by ELMER HIGGINS.)

New species of gobiid fishes discovered as a result of an investigation of the American members of this difficult family carried out by me for the last few years, on and off, are here described. The following accounts consist chiefly of brief preliminary diagnoses. However, I revised the genera to which they belong, in manuscript, and the diagnoses state their most essential or key characters which are sufficient to distinguish the species; but of course, they are not adequate for a full understanding of their relationship to all the species within their respective genera. Especially important characters left out of these preliminary accounts refer to the lateral line organs. These structures have hitherto been neglected in accounts of American gobies; but they are of unusual scientific interest, and of great importance in the classification of gobies, especially in the delimitation of the genera and subgenera. However, it would perhaps be more

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confusing than illuminating to describe these structures in fragmentary form and without illustrations. They will be considered later at some length and in systematic manner for all American gobies. Fuller accounts and a discussion of the relationship of the species will also be given in the generic revisions.

Special mention is made here of two very valuable collections which contributed the majority of the newly discovered species. One is a small but very important collection obtained by the Pawnee, of the Bingham Oceanographic Foundation, during 1925 and 1926, and submitted to me for study through the generosity of Professor Albert E. Parr. This collection, from the Atlantic and Pacific, contained eight new species, three of which I (1938, pp. 114, 119 and 120) have already described, while the other five are described here.

The other one is that obtained by Dr. Samuel F. Hildebrand in Panama as a result of and in connection with his study of the fauna of the locks of the Panama Canal during 1935 and 1937, at the time the locks were drained. This collection which Doctor Hildebrand very generously turned over to me for study, included seven undescribed species, one of which I (1938, p. 112) already described, and the other six are included here. This collection shows two things: first, the wealth of the gobiid fauna of the Isthmus of Panama, a region that has been comparatively well worked before, both in the number of species and their abundance; second, the industry, perseverance and ingenuity of Doctor Hildebrand in obtaining such an unusual collection. A large part of his success was due to the assiduous salvage of representative fishes left after the locks were drained, having obtained five new species then. However, the value of the collection is not to be gauged only by the new species discovered. The material obtained enabled me also to distinguish more accurately and draw up more adequate accounts of previously established species in my revisions of their genera. Doctor Hildebrand permits me to state that an important factor in his marked success was the use of poison in proper places in tide pools, chiefly those having a muddy or partly muddy bottom.

The numerical value of a given measurement is always expressed as a percentage of the standard length. The length of a specimen recorded refers to the total length, including the caudal fin, unless otherwise specified.

*Lophogobius cristulatus*, n. sp.

Nuchal crest low. Anterior boundary of scaled area on antedorsal extent in a nearly straight transverse line only a little behind eye. Depth 29,

caudal 27.5, ventral 27, pectoral 25. D. 10, A. 9, P. 19, C. 15 (branched rays).

*Holotype*.—U. S. N. M. 107294. Pacific coast of Panama; S. F. Hildebrand. Male 74 mm. The original label was lost. It was probably collected on Farfan Beach near Balboa.

This appears to be the first record of a *Lophogobius* from the Pacific coast of America. The specimen examined represents a species distinct from the common *L. cyprinoides* of the Atlantic, differing in having the nuchal crest strikingly lower, and the antedorsal distance completely covered with scales, except for a narrow transverse area behind the eye. The proportions of the depth and fins of the single specimen examined have lower numerical values than specimens of *cyprinoides* of similar size. The caudal has 15 branched rays, while in 55 specimens of *cyprinoides* counted, only 2 had 15 rays, the preponderant majority having 14.

#### *Lythrypnus heterochroma*, n. sp.

D. 10, A. 9, P. 15. Scales very large, 22, the anterior most ones situated on a vertical through base of third dorsal spine. Six transverse bands under first dorsal, two longitudinal bands on posterior part of body.

*Holotype*.—Bingham Oceanographic Collection 375. Glover Reef, off the coast of Yucatan, Mexico. Male 22 mm.

Of all the known American gobies this species is structurally nearest to (*Gobius*) *Lythrypnus mowbrayi* (Bean), but the two species are probably of comparatively remote relationship, their divergence being of at least sub-generic magnitude. This question will be considered at some future time. It will suffice to state here that *heterochroma* differs from *mowbrayi* in having larger scales. It further differs from *mowbrayi*, as well as from all known American gobies, in having a fairly well marked diphasic color pattern, transversely banded anteriorly, longitudinally banded posteriorly.

#### *Lythrypnus dalli* (Gilbert)

*Restriction of the name dalli*.—Having revised the genus *Lythrypnus* it became apparent that the gobies hitherto designated as *dalli* in the literature, including Gilbert's original material, belong to at least two species. Gilbert did not designate a holotype, and it becomes necessary to definitely restrict the application of the name *dalli* in order to supply both species with names.

I examined five specimens of what appears to be Gilbert's original material, two in the Bureau of Fisheries and three in the National Museum, labeled *Gobius dalli*. All five specimens are in bad condition. They are faded and the fins are broken, while the color and the relative length of the spines and rays are, in general, of importance in properly distinguishing the species of *Lythrypnus*. They are thus poorly adapted for study in distinguishing species; but our final decision regarding the status of the name *dalli* must be based on their study, and the pertinent characters that may be deciphered are stated.

The two specimens in the Bureau of Fisheries, from Albatross station 3001, are in worst condition. They are entirely faded and the fin rays cannot be counted with assurance. As near as I can determine, the counts are D. 16, A. 13. They apparently belong to *dalli* as here restricted.

The three specimens in the National Museum are in two jars, having different museum numbers, but both bearing the red type label. Jar 48255 contains two specimens, from Albatross station 3001 in the Gulf of California, 14 and 17 mm in standard length, having D. 16, A. 13, P. 18, and D. 18, A. 14, P. 18, respectively. Traces left of the cross bands are of approximately the same width as in 18 other specimens examined, in good condition, also from the Gulf of California, that will be described in a revision of the genus. These two specimens are apparently conspecific with the other 18, and the smaller one is here formally designated as the lectotype.

Jar 41974 contains one specimen, from Catalina Island, 27 mm in standard length, having D. 18, A. 15, P. 19. In the fin ray counts it more nearly agrees with the following species, *latifascia*. Traces left of the bands are appreciably narrower than in the two more recently preserved specimens of *latifascia* examined, and are more nearly like in *dalli* as here restricted, but their narrow appearance is probably due to fading. Very probably this specimen is an example of *latifascia*, unless still another closely related species exists at Catalina Island.

*Lectotype*.—U. S. N. M. 107287. Gulf of California, Albatross station 3001, lat. 24° 55' 15", long. 110° 39'; 33 fathoms; March 16, 1889; 14 mm in standard length.

***Lythrypnus latifascia*, n. sp.**

D. 18, A. 14–15, P. 18–19. Tip of longest dorsal spine reaching base of sixth dorsal ray in female. Dark cross bands wide.

*Holotype*.—U. S. N. M. 107282. Fishermen's Cove, Catalina Island, California; Vernon Brock; June 25, 1935; female 22 mm in standard length.

This species differs from *dalli*, as restricted above, in having strikingly wider cross bands. Color differences in the genus *Lythrypnus*, in general, are so striking and fairly constant, that they must be considered as of specific importance, on a par with structural differences in other genera, as I will discuss fully in the revision of the genus. Judged by the two specimens examined, *latifascia* has average higher counts of the fin rays, and the spines in the female at least, are longer than in *dalli*.

***Lythrypnus crinitus*, n. sp.**

D. 17, A. 13, P. 19. Longest dorsal spine reaching end of second dorsal in male. Cross bands on body obsolescent, only very feeble traces of such bands discernible.

*Holotype*.—U. S. N. M. 107281. Albemarle Island, Galapagos Archipelago; 32 fathoms; W. L. Schmitt; January 25, 1934; male 30 mm.

This species fairly well agrees in its important structural characters with *dalli*; the differences in the specimens examined are of a minor nature. It differs from *dalli* chiefly in color, lacking the striking cross bands present in that species. It is a markedly pale species, unlike all its congeners which have the color pattern strikingly developed and beautiful.

***Microgobius emblematicus* (Jordan and Gilbert)**

*Restriction of the name emblematicus*.—Before the following species may be supplied with a name, it becomes necessary to definitely restrict the use



of the older name *emblematicus*. The types on which that name has been based appear to have been lost, while the original description is more or less applicable to three distinct species that occur in the type locality. It is very probable that the authors of *emblematicus* had a mixture of the three species, since all three are common and they failed to take proper account of their distinguishing characters.

The paper in which *emblematicus* was established (Jordan and Gilbert, 1882, p. 330) consists of descriptions of the new species contained in a collection made for the National Museum, and the types presumably should have been deposited in that museum. However, they are not present on the shelves and no record was found in the register or card catalog of the museum to indicate that the types ever reached there. Furthermore, in the paper referred to, the authors give museum numbers for all the other species described there, with the sole exception of *emblematicus*. It seems apparent, therefore, that the types were lost, and failed to reach the museum. They are probably not now in existence, and we must rely entirely on the authors' account to determine the status of the name *emblematicus*.

Outside of the description of life colors which I have no means of checking at present, the only pertinent statements in the original description that may throw some light on the question as to which species the authors had, are as follows: "Dorsal spines very slender and weak, some of the middle ones usually prolonged, sometimes nearly reaching to base of caudal, sometimes little elevated . . . D. VII-16; A. 17." The words "sometimes reaching nearly to base of caudal" shows that the authors had some specimens at least of that species to which the name *emblematicus* is here restricted; the rest of the above quoted statement refers to females of the same species and equally as well to the species described below as *brevispinis* or to *M. tabogensis* Meek and Hildebrand (1928, p. 873). The count of the second dorsal refers only to *emblematicus*, as here restricted, according to my determination of the frequency distributions of the three species. The anal count refers to the same species and to *tabogensis* as well, but not to *brevispinis*. However, the differences between the predominant numbers of the two counts among the three species is only one ray, and hence the counts are not of decisive importance in this connection. It may be concluded then that the original account was based certainly on some specimens of *emblematicus* as restricted below, and quite probably also on specimens of one or both the other species. The question now is whether later authors restricted the use of the name *emblematicus*.

That name was used in connection with actual specimens in two later works. Gilbert and Starks (1904, p. 174) had specimens of at least two of the species which they recorded under the one name, *emblematicus*. I examined a lot of only 5 of their specimens and found it to consist of a mixture of two species. Consequently, they cannot be said to have restricted the use of that name. The next authors who treated of the species concerned are Meek and Hildebrand (1928, pp. 871-874). They definitely distinguished *tabogensis*. Furthermore, I examined part of their material which they included under their account of *emblematicus*, the part deposited in the National Museum, and find that all those specimens belong to that species here described as *brevispinis*. Nevertheless, it cannot be said that these authors thus restricted the use of the name *emblematicus* to that species. They did not state so definitely and they apparently did not suspect that the name *emblematicus* was possibly based on more than one species.

Since this was not done by previous authors, the name *emblematicus* is

herewith restricted by the formal designation of a neotype. As here restricted, *emblematicus* differs from *brevispinis* chiefly in the extent of the squamation, the number of fin rays, and the relative length of the dorsal spines and ventral fin of the male. *M. tabogensis* differs from both chiefly in having a patch of modified, ctenoid scales at some distance behind the base of the pectoral fin. The restriction as made seems to be best on a consideration of all the points involved. It saves Meek and Hildebrand's *tabogensis* as a valid name, and we know for certain that the original authors had some specimens of the species to which the name is restricted. The name *emblematicus* itself applies to the species restricted more than to the other two.

*Neotype*.—Stanford University Collection 33208. Panama Bay; C. H. Gilbert; male 39 mm in standard length.

#### ***Microgobius brevispinis*, n. sp.**

Mouth oblique, end of maxillary falling under middle of eye to under posterior margin of pupil. Scales 62–72, all cycloid; bare area on back under first dorsal comparatively restricted. Predorsal fold moderate. Tip of longest spine reaching base of second to fourth ray in male, a little short of origin of second dorsal in female. D. 17–18, A. 18–19, P. 22–23. Ventral approximately reaching origin of anal in male, falling considerably short in female. A spot or band below first dorsal absent or very faint.

*Holotype*.—U. S. N. M. 81842. Balboa, Panama; in tide pools; Meek and Hildebrand; February 7, 1912; male 42 mm in standard length.

This species is nearest to *emblematicus* as restricted above where their distinguishing characters are indicated.

#### ***Microgobius curtus*, n. sp.**

Mouth moderately oblique, end of maxillary under middle of eye or a little short of that point. Scales 62–70, cycloid, except a small patch of rather weakly spinuliferous scales at middle of body under first dorsal; bare area on back under first dorsal moderate. Predorsal fold very low to nearly obsolescent. Tip of longest spine reaching base of eighth to fifteenth ray. D. 16, A. 16, P. 21–22.

*Holotype*.—U. S. N. M. 107292. Salada, Guayaquil, Ecuador; in mangrove swamp; October 1–2, 1926; W. L. Schmitt; male 30 mm in standard length.

Structurally this species is nearest to *M. tabogensis* Meek and Hildebrand. It differs in having smaller scales, fewer fin rays, and longer spines in the female especially.

#### ***Parrella macropteryx*, n. sp.**

Scales about 28–29, present on antedorsal distance. Maxillary rather long, its posterior end on a vertical at some distance behind eye in large male. Tip of longest spine reaching base of tenth ray. D. 13, A. 12. P. 16–18. Pectoral unusually long, its tip reaching to under base of seventh or eighth dorsal ray. Head subterete, interorbital narrow. Pectoral 44–45, caudal 60, depth 18.5–19.5, depth of caudal peduncle 11–11.5, maxillary in male 15.5–17. A series of five diffuse blotches on body.

*Holotype*.—Bingham Oceanographic Collection 1688. Siguanea Bay, Isle of Pines, Cuba; taken by the Pawnee with a trawl; April 6, 1925; male 55 mm.

This species differs from *Parrella maxillaris*, the only other known species of its genus, in having scales on the antedorsal area, a shorter maxillary, more numerous rays in dorsal and anal, fewer pectoral rays, a longer pectoral and caudal, longer dorsal spines, and having the body not as slender. It may be distinguished from all known American gobies by its extremely long pectoral.

***Parrella spilopteryx*, n. sp.**

Scales 34, present on antedorsal distance. End of maxillary under middle of eye in male. Tip of longest dorsal spine falling short of origin of second dorsal. D. 12, A. 12, P. 21. Pectoral of moderate length reaching a vertical through base of third dorsal ray. Head somewhat depressed; interorbital wide. Pectoral 31.5, caudal 42.5, depth 21.5, depth of caudal peduncle 10.5, maxillary 12. Body with four, diffuse, rather wide cross bands; a black spot on base of pectoral near its upper margin.

*Holotype*.—U. S. N. M. 107293. Miraflores Locks, Panama Canal; upper chamber, east side; S. F. Hildebrand; April 28, 1937; male 74 mm, the only specimen examined.

This species is evidently widely divergent from both *P. maxillaris* and *P. macropteryx*. It differs from both in having a notably shorter maxillary, depressed head and wide interorbital.

***Parrella fusca*, n. sp.**

Scales about 38, present on antedorsal distance. Maxillary ending under middle of eye. Tip of longest dorsal spine failing to reach origin of second dorsal. D. 13, A. 13. P. 20. Head depressed, interorbital rather wide. Caudal 38.5, depth 20, depth of caudal peduncle 8, maxillary 10. Color nearly uniform, dark brown, shaded with lighter color.

*Holotype*.—U. S. N. M. 107295. Miraflores Locks, Panama Canal, lower chamber; S. F. Hildebrand; March, 1937; female 42 mm, the only specimen examined.

This species is nearest structurally to *spilopteryx*, but is evidently widely divergent from it. They diverge chiefly in the lateral line organs. Without considering the lateral line organs for the present, the two species are separable by their color, and by *fusca* having a more slender caudal peduncle and more numerous dorsal and anal rays.

The three new species of *Parrella* here described, together with the hitherto only known genotype, constitute a rather heterogeneous group. However, although the four species are rather widely divergent, they are apparently nearer to one another than any one of them is to other gobies, and they are properly grouped in one genus. Furthermore, the genus *Parr-ella* as now constituted bridges the gap, in some important respects, between *Microgobius* and *Bollmannia*. A full discussion of the proper boundaries of these three genera, and their relationship, involves a consideration of the relationship of the contained species, respectively, and would take up too much space. This discussion is reserved for a later paper.



*Bollmannia chlamydes* Jordan

*Restriction of the name chlamydes.*—It is necessary to definitely restrict the application of the name *chlamydes*, because Jordan's account is based on at least two species, possibly more. Most of Jordan's specimens, judged by the material now preserved in the National Museum, belonged to *chlamydes*, as restricted below. The number of fin rays given in the original description refers to this species; but the color description is undoubtedly based in part on the following species, *umbrosa*, and at least one of the six specimens on which I base that species have been separated from presumably Jordan's original material. These two species are very markedly distinct, and a study of their lateral line organs shows that the divergence between them is of subgeneric magnitude. In spite of their wide divergence, specimens of both species were included in the original description of *chlamydes*. Jordan also states: "Middle caudal rays very long, somewhat more than half length of body." This statement agrees and nearly agrees with the two species here described as *longipinnis* and *pawneeae*, respectively. The caudal in the specimens examined of *chlamydes*, as here restricted, is broken. In one specimen in which it appears to be nearly entire, it is about one-third the standard length. Since the caudal length is of specific importance among the species of *Bollmannia*, it is very possible that one or two still other species were included in the original account of *chlamydes*.

The question now comes up, did Jordan restrict his species by designating a particular specimen as the type? Seemingly he did so, since the original description states the type to be U. S. N. M. 41158, and its length is given as  $4\frac{3}{4}$  inches. However, the type specimen cannot now be identified with certainty, as follows.

U. S. N. M. 41158, presumably the type, is entered on the register as having been obtained at Albatross station 2804, whereas only two stations are mentioned in the original description, 2800 and 2805. Furthermore, jar 41158 now contains two specimens (belonging to two distinct species), while Jordan definitely designated a single specimen as the type and stated its length in the original description. To add further to the tangle it is to be noted that numbers 41142, 41234, 41461 and 41489 were also entered in the museum register as being the "type" of the species. Number 41158 now bears the red type label but it was probably attached at some later time, since numbers 41142 and 41489 containing a single specimen each, formerly bore red labels which are now placed within the jars. It is apparent, therefore, that some error has been committed. Either the museum number or the Albatross station numbers as given in the original description are erroneous. It is also possible that the type specimen after having been studied was never set aside definitely or that it was later mixed with other specimens.

In view of these uncertainties and the necessity of definitely restricting the name *chlamydes*, one out of three specimens in U. S. N. M. 41234, from Albatross station 2800, is hereby designated as the lectotype. The lot of three specimens was originally entered on the register as "types." Of the two specimens in 41158, the larger one, a female 82 mm in standard length, also belongs to this species (the smaller one now designated as U. S. N. M. 107288 is an *umbrosa*). Consequently the present restriction of *chlamydes* will stand even if we assume that 41158 is the true type.

*Lectotype.*—U. S. N. M. 93825. Panama Bay; Albatross station 2800, lat.  $8^{\circ} 51'$ , long.  $79^{\circ} 31' 30''$ ; 7 fathoms; March 30, 1888; male 75 mm in standard length.



***Bollmannia umbrosa*, n. sp.**

Dorsal and anal rays usually 13 and 14, respectively, sometimes 12 and 13, respectively. Pectoral rays 24–26. A lengthwise row of large scales at lower margin of cheek in addition to other scales; approximately upper third of opercle covered with 3 or 4 rather large scales. Tip of longest dorsal spine reaching base of third to fifth ray in large females. Head 30–32, eye 8.5–9, depth of caudal peduncle 10–11. Body with 8–10 faint cross bands; first dorsal with a black blotch; upper lip with a black marginal band.

*Holotype*.—U. S. N. M. 107290. Panama Bay; Albatross station 2804, lat. 8° 16' 30", long. 79° 37' 45"; 47 fathoms; March 30, 1888; male 70 mm in standard length. Removed from U. S. N. M. 41395, containing in addition 4 specimens of *B. chlamydes* as restricted above.

This species is closely related to *B. macropoma* Gilbert, differing in having a smaller eye, somewhat deeper caudal peduncle, somewhat longer dorsal spines, and more numerous cross bars on the body.

***Bollmannia marginalis*, n. sp.**

D. 14–15, A. 14–15, P. 24–25. Row of scales at lower margin of cheek absent; upper third of opercle covered with large scales. Tip of longest dorsal spine in male reaching to middle of second dorsal base and as far as middle of caudal peduncle. Head 27.5–28.5, caudal 36.5–39, eye 8.5–9.5, depth of caudal peduncle 9.5–11. Body with a median row of five black blotches; first dorsal with a black spot at its margin; no black band on upper lip.

*Holotype*.—U. S. N. M. 107284. Solango Island, Ecuador; 12 fathoms; W. L. Schmitt; January 18, 1935; male 56 mm.

Judged by the lateral line organs this species is nearest to *B. litura* from the Atlantic, differing strikingly in having more numerous fin rays, a shorter head and caudal, a smaller eye, and a more slender caudal peduncle. The combination of a short caudal and long dorsal spines is distinctive. It differs from all its congeners in having the dorsal spot located at the margin of the fin.

***Bollmannia ocellata* Gilbert**

*Restriction of the name ocellata*.—The National Museum does not have any specimen or a jar of specimens of *ocellata*, which is labeled as the type, and there is no record of such a type ever having been present. Apparently no type of this species has ever been set aside. From Gilbert's original description one gathers that most of his specimens had comparatively long spines while some had rather short ones. In my revision of the genus I have distinguished in manuscript three closely related species from the Gulf of California, which differ, in part, according to the length of the spines, and it seems possible that Gilbert included two or all three of these species under his account of *ocellata*. At any rate, the original account applies to a mixture of these three species. It therefore becomes necessary, in order to supply all three species with names, to restrict the name *ocellata* to one of these species and designate a lectotype. The original description was based on "numerous specimens" from Albatross stations 3031 and 3035. The National Museum now has but three lots of specimens labeled "*Bollmannia ocellata*," only one of the lots, U. S. N. M. 46695, from the type localities, from station 3031.

No other specimens from the two original stations are present in either the Bureau of Fisheries or the National Museum. I am, therefore, constrained to restrict *ocellata* to this lot and designate one of the specimens as the lectotype, although the specimens are not in good condition and most of Gilbert's specimens possibly did not belong to this species. Strictly speaking the specimen selected may not be a lectotype, since it is not certain that the lot of specimens under consideration were examined by Gilbert when he established his *ocellata*. If this lot was not included in Gilbert's original material, such material may not be in existence now, and the specimen here selected is properly a neotype. Whatever the type is to be called, the name *ocellata* is herewith formally restricted to the species represented by the type selected.

*Lectotype*.—U. S. N. M. 107286. Off Bay Adair, Gulf of California; Albartross station 3031; lat.  $31^{\circ} 6' 45''$ , long.  $114^{\circ} 28' 15''$ ; 33 fathoms; March 27, 1889; female 76 mm. Removed from U. S. N. M. 46695 containing 7 other specimens of the same species.

***Bollmannia pawneeae*, n. sp.**

Dorsal and anal rays usually 14, sometimes 13. Pectoral rays 23–25. Row of scales at lower margin of cheek absent; opercle with 4 or 5 large scales almost entirely covering upper half. Tip of longest dorsal spines in male reaching a point between base of twelfth ray and middle of caudal peduncle. Head 29–32, caudal 37–43, depth of caudal peduncle 11–13. First dorsal with a black spot, no other distinctive color marks on head and body.

*Holotype*.—Bingham Oceanographic Collection 1689. Perlas Islands, Panama Bay, lat.  $8^{\circ} 29' 40''$ , long.  $78^{\circ} 52' 30''$ ; 19–24 fathoms; collected by the Pawnee; March 31, 1926; female 93 mm.

Specimens of this species were also examined from the Gulf of California. This species is apparently near to *ocellata* as restricted above, differing in having longer dorsal spines and a deeper caudal peduncle. This species is especially characterized by a great profusion of cutaneous papillae.

***Bollmannia longipinnis*, n. sp.**

D. 14, A. 14, P. 22–23. Row of scales at lower margin of cheek absent; opercle with 2 or 3 scales of moderate size at upper anterior corner. Tip of longest dorsal spine in male reaching beyond base of caudal, somewhat shorter in female. Head 29–30, caudal 50–68, depth of caudal peduncle 11.5–12.5. First dorsal with a black spot, no other distinctive color marks on head and body.

*Holotype*.—Bingham Oceanographic Collection 1690. Angeles Bay, Gulf of California; collected by the Pawnee; May 13, 1926; male 127 mm.

This is a well marked species, and is saliently characterized by the combination of excessively long spines, a long caudal, and a reduced squamation on the opercle. Its nearest relatives seem to be *pawneeae* and *ocellata*.

***Risor mirus*, n. sp.**

D. 11, A. 9, P. 17. Ventral attaining origin of anal or slightly beyond. Maxillary ending under anterior margin of pupil.

*Holotype*.—Bingham Oceanographic Collection 1691. Siguanee Bay, Isle of Pines, Cuba; trawl; collected by the Pawnee; April 6, 1925; male 22 mm.

This species differs from the two known species of its genus, *R. binghami* (Parr) and *R. ruber* (Rosen), by a combination of three characters, namely, having one or two rays less in the dorsal, a longer ventral and a shorter maxillary. It further differs from *binghami* in having two mucous pores, instead of one, on the interorbital space.

The peculiar and unusual structure of the head and especially that of the lips and dentition were originally used by me in establishing *Risor* (1933, p. 56). At the time of its establishment I had only one specimen for study and *Risor* was therefore placed as a subgenus of *Garmannia* to which the species were assigned by previous authors, pending the study of more specimens in order to gain some knowledge in regard to the variability of these characters. I have now studied 6 more specimens. The striking characters on the basis of which *Risor* was originally established prove to be fairly constant and peculiar to the three species examined. These characters indicate a very high degree of divergence, and *Risor* is, therefore, recognized as a distinct genus.

***Enypnias aceras*, n. sp.**

Scales 41–46, not embedded, those on posterior part of body and caudal peduncle ctenoid. No flaps on top of snout. Dorsal rays 14. Body with a cross-banded color pattern well or fairly marked; no well marked spot at base of pectoral.

*Holotype*.—U. S. N. M. 107298. Miraflores Locks, Panama Canal, lower chamber; S. F. Hildebrand; March 1937; male 41 mm.

It is an easy matter to distinguish this species from *E. seminudus* (Günther), the only other known species of its genus, by the larger, non-embedded, ctenoid scales, the absence of flaps on snout, and the banded color pattern.

***Garmannia hildebrandi*, n. sp.**

Scales 25–30, extending forward to a vertical approximately through origin of first dorsal; anterior bare area at dorsal and ventral profile extensive; usually 4 scales in caudal row, sometimes 5 or 6. First dorsal spine prolonged in male. D. 11, A. 10–11, P. 16–18. Head subterete. Maxillary ending under posterior margin of pupil in male, slightly short of that in female. Depth of caudal peduncle 13–15. Diffusely cross-banded color pattern.

*Holotype*.—U. S. N. M. 107297. Gatun Locks, Panama Canal, upper chamber; S. F. Hildebrand; February 21, 1935; male 35 mm.

Doctor Hildebrand obtained 25 other specimens with the type, and it is evidently a common species. This species is of much interest from the point of view of geographic distribution. In 1937 Doctor Hildebrand also obtained 4 specimens in the Pedro Miguel Locks. This is the only gobiid that has been found so far on the Atlantic and Pacific sides of the Isthmus of Panama. But whether it existed on both sides before the canal was opened remains unknown.

This species is near structurally to (*Gobius*) *Garmannia chiquita* (Jenkins and Evermann), differing in the subterete head and in having the anterior



bare areas at the dorsal and ventral profiles more extensive. The scales in the caudal row are usually 4, instead of 6, and the number of pectoral rays is less, but there is a certain degree of intergradation in these characters. The most striking difference between them is found in the lateral line organs.

I take pleasure in naming this common and interesting species after my colleague in the Bureau of Fisheries and its efficient collector, Dr. Samuel F. Hildebrand.

***Garmannia spilota*, n. sp.**

Scales 29, extending to a vertical a little in front of origin of first dorsal, anterior bare area at dorsal and ventral profile moderate; 4 scales in caudal row. First spine not prolonged. D. 11, A. 10, P. 19. Head depressed. Maxillary ending under posterior margin of pupil. Depth of caudal peduncle 16.5. Body not banded, nearly uniformly colored, with a longitudinal median row of spots.

*Holotype*.—U. S. N. M. 81828. Colon, Panama; in tide pools; Meek and Hildebrand; March 12, 1912; male 24 mm.

This species is nearest to *hildebrandi*; differing in having a deeper caudal peduncle, more numerous pectoral rays, the bare areas in front less extensive and in color.

***Garmannia spes*, n. sp.**

Scales extending forward to a point under base of second to fourth dorsal ray; two isolated, large, ctenoid scales, one behind the other, at a short distance behind base of pectoral, near midline. D. 11–12, A. 10, P. 16. Head depressed. Maxillary ending under middle of eye. Depth of caudal peduncle 12. Body diffusely and very irregularly cross-banded.

*Holotype*.—U. S. N. M. 107299. Drydock, Mt. Hope, Canal Zone; J. B. Shropshire; February 18, 1937; female 20 mm.

This species seems to be most nearly related to *G. paradoxa* (Günther), apparently being the Atlantic coast counterpart of that Pacific coast species. The extent of squamation is the same as in *paradoxa* and it has the two isolated scales behind the pectoral which is characteristic of that species. It differs in having fewer pectoral rays.

***Garmannia homochroma*, n. sp.**

Scales 28–31, anteriormost scales on a vertical near base of pectoral; anterior bare areas moderate; usually 4 scales in caudal row, sometimes 5 or 6. First dorsal spine in male not prolonged. D. 11–12. A. 10, P. 18–20. A small barbule below anterior nostril. Head markedly depressed. Maxillary notably long, extending to a vertical behind eye in male. Depth of caudal peduncle 12.5–16. Body nearly uniformly and very moderately dusky, only very faint traces of cross bands when viewed from dorsal aspect.

*Holotype*.—U. S. N. M. 107296. Pedro Miguel Locks, Panama Canal; S. F. Hildebrand; February 20, 1937; male 25.5 mm in standard length.

In addition to well marked differences in the lateral line organs, this species differs from all its other congeners, by the following combination of characters: the presence of a barbule, a very long maxillary, a notably de-

pressed head. On account of the very distinctive combination of all characters, its immediate relationship is not patent. Its nearest relatives are possibly *spilota* or *chiquita*, but the divergence is wide.

***Garmannia pallens*, n. sp.**

Scales 9–12, extending forward to a point under bases of sixth to eighth dorsal rays; 4 scales in caudal row. First spine of male prolonged. D. 11, A. 9, P. 15–16. Head compressed. End of maxillary in male reaching a point under posterior margin of eye. Light yellowish, crossed by 13–14 narrow, dark bands.

*Holotype*.—U. S. N. M. 107327. Barahona Harbor, Santo Domingo; in 2–4 feet; rocky bottom; John C. Armstrong; July 9, 1933; male 15 mm.

This species is nearest to *G. macrodon* (Beebe and Tee-Van), differing in a notably greater extent of squamation, fewer fin rays, and a paler color.

***Gobulus myersi*, n. sp.**

D. 11, A. 10, P. 15. Head 30.5, depth of head 14, depth 18, depth of caudal peduncle 10.5. Ventral aspect darker than dorsal aspect.

*Holotype*.—U. S. N. M. 107283. Gulf of Mexico, off Cape Sable; Albatross station 2374, lat. 29° 11' 30", long, 85° 29'; 26 fathoms; February 7, 1885; male 27 mm.

This is the first species of its genus now to be made known from the east coast. It is evidently nearest to *G. crescentalis* (Gilbert), from the Gulf of California, differing in having a deeper body and head, and one or two fewer rays in the pectoral.

It is a pleasure to name this species after Professor George S. Myers of Stanford University, who discovered and salvaged the type from a lot of neglected, unidentified, miscellaneous material while he was in charge of the Division of Fishes in the National Museum.

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ZOOLOGY.—*North American monogenetic trematodes. III. The family Capsalidae (Capsaloidea)*.<sup>1</sup> EMMETT W. PRICE, U. S. Bureau of Animal Industry.

This paper is the third of a series on the North American mono-

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